

REMARKS

Applicant would first like to thank Examiner Khatri for this examination.

Claims 1-19 are currently pending in the application, and claims 1-19 stand rejected under 35 USC 101 as claiming non-statutory subject matter, specifically as claiming an abstract idea. Claims 1-19 are also rejected under 35 USC 112, second paragraph as being incomplete omitting essential steps. Claims 1-19 are further rejected under 35 USC 102 as being anticipated by US Pat. No. 5,960,196 to Carrier III et al (hereafter Carrier).

SPECIFICATION

The office action provides guidelines for an abstract. Applicant appreciates this information and respectfully contends that the abstract, as provided, meets all statutory requirements.

CLAIM REJECTIONS - 35 USC 101

Claims 1-19 stand rejected under 35 USC 101 as claiming a non-statutory abstract idea. The office action states the claims "do not disclose that how a method will carry out indented functionality and how this will be processed without incorporating a processor, memory and medium. Therefore, claims 1-12 are not able to produce useful and its functionality can't be realized." Applicants respectfully suggest that this analysis is not clear. As best understood, this analysis is intended to apply to all of claims 1-19 as an earlier statement indicates that claims 1-19 are rejected. Also, as best understood, this argument appears to suggest that absent a recitation in the claim of a processor, memory, and medium, the claims are a natural phenomena or abstract idea. The argument also appears to suggest that the foregoing definition of abstract ideas was articulated in the case *In re Warmerdam*.

In the case *In re Warmerdam*, the Federal Circuit citing Schrader stated that the dispositive issue for assessing compliance with Section 101 in a process claim is whether the claim is for a process that goes beyond simply manipulating "abstract ideas" or "natural phenomena". The Court reasoned that Warmerdam's claim 1 (which was a process claim) was not patentable under Section 101 because the body of claim 1 recited only two steps: "locating" a medial axis, and "creating" a bubble hierarchy," and that both steps describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic "abstract idea." It should be noted that in the case *In re Warmerdam*, the Court states that "if a claim requires more than the manipulation of ideas so that the process described in the claim produces something quite different, then the process might indeed describe statutory subject matter."

Applicant would like to respectfully point out that claims 9-11 are directed to an apparatus comprising logic. Applicant respectfully contends that the Office Action analysis is not appropriate for such apparatus. An apparatus comprising logic is tangible, concrete, and useful and can not by definition be limited to manipulation of abstract ideas. Moreover, as clearly indicated in the specification, this logic may be a processor such as a microprocessor, and may include internal memory {see para. 018}. As such, claims 9-11 are directed to an apparatus comprising logic performing stated functions on a software component and produce something completely different -- a tangible and useful metric for software complexity which is useful in among other purposes: resource allocation, planning, scheduling, and cost estimation. As will be readily understood by those of ordinary skill in the art, this metric can be provided in various useful tangible forms, including: a digital memory with the metric encoded thereon, a display or paper media with the metric visible thereon, a digital media with the metric encoded thereon.

Applicant would also like to respectfully point out that claims 12-19 are directed to a program storage device readable by machine, tangibly embodying a program of instructions executable by machine to perform method steps for determining complexity of a software component. Applicant respectfully contends that the Office Action analysis is not appropriate for a program storage device which is a product of manufacture and not a process. A program storage device is tangible, concrete, and useful and can not by definition be limited to manipulation of abstract ideas. Moreover, as clearly defined in the specification {see para. 20} the program storage device implements the methods described and controls implementations of the apparatus described. Thus, the tangible, concrete and useful program storage device implements a method for providing a useful metric. Furthermore, the usefulness of program storage device can be realized by control of the apparatus described in the specification.

With regard to the method or process claims 1-8, Applicant respectfully contends that they meet the statutory requirements of section 101. In *Schrader* the Federal Circuit determined that section 101 required a process claim to have a transformation or reduction of subject matter and that data or signals may constitute subject matter. Claim 1 includes several transformations of subject matter. First, a plurality of versions of a software component are created. As specifically provided in the specification a normalized version of the software component may be created by, for example, removing comment, converting sequences of spaces into a single space, and sorting the remaining lines in lexicographic order. Alternatively, a normalized version of the software component may be created by reformatting the program text according to a stylistic standard. Similarly, a normalized unique version may be created by eliminating duplicate lines. Creating new versions of a software component clearly comprises a transformation of subject matter – the subject matter being the program text of the software component. The newly created version is something different than the original program text of the software component.

Additionally, the step of compressing the versions of the software component is also a transformation, as the compressed versions are something different than the versions created in the previous step.

Finally, providing a software complexity metric comprising a comparison of the lengths of the compressed versions is yet another transformation. The software complexity metric is not a mere abstract idea, but a useful tool in the field of software development and testing for assessing the effort required for various operations pertaining to the software. Moreover, Applicant would like to respectfully point out that the metric is not merely a number, but a measure of a tangible thing, namely the complexity of a specific software component.

With regard to the analysis of the Office Action, Applicant respectfully disagrees that absent a recitation of a processor, memory and medium that a claim for a machine executable process is non-statutory. In *Schrader* the Federal Circuit determined that section 101 required a process claim to have a transformation or reduction of subject matter and that data or signals may constitute subject matter. In *Warmerdam* the Federal Circuit acknowledged that “if a claim requires more than the manipulation of ideas so that the process described in the claim produces something quite different, then the process might indeed describe statutory subject matter. Accordingly, Applicant respectfully contends that the test for statutory subject matter is not whether a processor, memory and medium are recited, but whether there is a transformation or reduction of subject matter (i.e., whether something different is produced). As pointed out above, claims 1-8 provide transformations and produce a metric which is a useful measure of the complexity of a software component and is quite different than the software component.

CLAIM REJECTIONS - 35 USC 112

Claims 1-19 stand rejected under 35 USC 112, second paragraph as being incomplete for omitting essential steps amounting to a gap between the steps. The Office Action argues that the steps of executing, storing and displaying are omitted, and refers to the MPEP at 2172.01. Applicant would like to respectfully point out that the Manual for Patent Examining Procedure is neither statutory nor does it comprise rules promulgated under authority given to an administrative agency. As such, the MPEP carries no authority in the examination of a patent application.

Applicant respectfully contends that the argument of the Office Action is unclear. Applicant can not determine whether the argument is that essential steps have been omitted such that the claims are not enabled as required by 35 USC 112 first paragraph or that the claims are indefinite and are rejected under 35 USC 112, second paragraph.

With regard to enablement, Applicant respectfully contends that claims 1-19 enable one of ordinary skill in the art to practice the invention. A person of ordinary skill in the art would not need to be taught how to execute a program of instructions or to load a software component in order to determine its complexity. Moreover, as would be understood by one of ordinary skill in the art, the metric can be provided in a variety of forms, including being displayed on a user interface or being stored on an internal or external memory.

With regard to definiteness, Applicant respectfully contends that claims 1-19 meet the statutory requirements of 35 USC 112, second paragraph, namely that the public is informed of the scope of the invention protected by the claims. The claims cover a variety of forms for providing the metric including both displaying the metric on a user interface and storing the metric in memory. Moreover, the claims clearly recite steps of creating, compressing, and determining. A person of ordinary skill in the art would understand that executing and storing are intrinsic in these functions, thereby meeting the definiteness requirement.

CLAIM REJECTIONS - 35 USC 102

Claims 1-19 stand rejected under 35 USC 102 as being anticipated by US Pat. No. 5,960,196 to Carrier III et al (hereafter Carrier).

Applicant respectfully contends that claim 1 is allowable because it includes a feature that is neither disclosed nor suggested by Carrier or any other reference cited, namely "creating a plurality of versions of the software component." Carrier is directed to a software release process having an integrated metric collection and reporting process. Carrier does not disclose or suggest creating a plurality of versions of a software component. Rather Carrier is directed to revision management to "synchronize the databases, so that the contents thereof are essentially identical over time" (see col. 7, lines 38-40). The software release system of Carrier is predicated on maintaining a single version of software for configuration management. Software is modified and the modification is migrated from one system to another. This difference is important because it is the comparison of the different versions of a software component that produce a valuable metric which looks beyond mere line counts to provide a useful metric of the complexity of the software component and thus to assess the scope of the effort required to build, modify, maintain, test, etc the software component.

Applicant respectfully contends that claim 1 is also allowable because it includes another feature that is neither disclosed nor suggested by Carrier or any other reference cited, namely "compressing each of the versions, to provide compressed versions." Carrier does not disclose or suggest compressing a software component in order to create a metric.

Applicant respectfully contends that claim 1 is also allowable because it includes another feature that is neither disclosed nor suggested by Carrier or any other reference cited, namely "providing a software complexity metric comprising a comparison of the lengths of the compressed versions." Carrier discloses a list of metrics at column 8, lines 10-20. However, none of the metrics cited disclose or suggest a comparison of lengths of different versions of a software component, much less different compressed versions. Rather the metrics include generic, previously known metrics such as a count of lines of code (KLOC) discussed in the specification at paragraph {003} and the number of lines changed in a source module. By sharp contrast, the

metric of claim 1 compares lengths of different versions of a software component after compression of the versions. These comparisons can be used to accurately access features of the software component such as redundancy of the implementation of the software component and propagation of defects as stated in paragraph {017} of the specification.

Claims 2-6 depend from claim 1 and Applicant respectfully contends that they are allowable for the reasons presented above.

Applicant respectfully contends that claims 3 and 4 are also allowable because they include additional features that are neither disclosed nor suggested by Carrier or any other reference cited, namely that the plurality of versions include “normalized program text” and “unique normalized program text”, respectively. As explained in the application these versions of the software component are useful for creating a complexity metric because they are independent of the programming language and take into account factors that affect complexity, such as code density and repetition. Carrier does not disclose or suggest either normalized program text or unique normalized program text.

Applicant respectfully contends that claims 5 and 6 are also allowable because they include additional features that are neither disclosed nor suggested by Carrier or any other reference cited, namely that the step of comparing includes a step of finding a ratio using the length of the compressed version of the raw program text (C0) and the length of the compressed version of normalized program text (C1) and a ratio of the length of the compressed version of normalized program text (C1) and the length of the compressed version of normalized unique program text (C2), respectively. Carrier does not disclose or suggest the ratios C0/C1 or C1/C2 or any other ratio of lengths of different versions of a software component as a complexity metric.

Applicants respectfully contend that claim 7 is allowable for the reasons that claim 1 is allowable and for the reasons that claim 5 is allowable, and that claim 8 is allowable for the reasons that claim 1 is allowable and the reasons that claim 6 is allowable.

Claims 9-11 are directed to an apparatus for carrying out the process of claims 1, 5, and 6, respectively and Applicant respectfully contends that they are allowable for the reasons that claims 1, 5, and 6 are allowable.

Claims 12-19 are directed to a program storage device having a program of instructions to perform the steps recited in the previously discussed claims 1-8. Applicant respectfully contends that claims 12-19 are allowable for the reasons that claims 1-8 are allowable, respectively.

CONCLUSION

In view of the amendments and arguments presented herein, Applicant respectfully

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contends that claims 1-19 are in condition for allowance. Accordingly, Applicant respectfully requests entry of the amendments, reconsideration and allowance of claims 1-19 and issuance of letters patent.

Sincerely,



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